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Relationship between optimism and athletic performance. Systematic review

Francisco J. Ortín-Montero¹, Alejandro Martínez-Rodríguez², Cristina Reche-García³, Enrique J. Garcés de los Fayos-Ruiz¹,
 and Juan González-Hernández⁴

1 Universidad de Murcia (Spain).

2 Universidad de Alicante (Spain).

3 Universidad Católica San Antonio, Murcia (Spain).

4 Universidad de Granada (Spain).

Título: Relación entre optimismo y rendimiento deportivo. Revisión sistemática.

Resumen: El optimismo es un factor psicológico moderador en el rendimiento deportivo. El objetivo de este trabajo es revisar la evidencia empírica de los trabajos relacionados con optimismo en el rendimiento deportivo, analizando la calidad metodológica de los estudios. Se realizó una búsqueda sistemática siguiendo las indicaciones de la guía PRISMA (Urrútia y Bonfill, 2013). Las bases de datos consultadas fueron PubMed, WOS, Scopus, Psycinfo y SportDiscus. Se seleccionaron para el análisis los trabajos que evaluaban el optimismo y el rendimiento en contexto deportivo ($n = 7$). Para el análisis de la calidad se utilizó el Instrumento para la lectura crítica y la evaluación de estudios epidemiológicos de Berra, Elorza-Ricart, Estrada y Sánchez (2008). Posteriormente se calculó la fiabilidad interjueces, con dos jueces participantes, mediante el coeficiente kappa de Cohen. La metodología utilizada en los estudios seleccionados fue en su mayor parte análisis correlacionales entre resultados de la escala LOT y el rendimiento de los deportistas, evaluado de distintas formas. En general, las medidas de optimismo fueron relacionadas con un aumento del rendimiento deportivo. La calidad de los estudios se considera media. Investigaciones futuras debe mejorar mediante procedimientos más experimentales, con calidad y rigor metodológico.

Palabras clave: Rendimiento; optimismo; deporte; LOT; revisión sistemática.

Abstract: Optimism is a moderating psychological factor in sports performance. The aim of this study is to review the current evidence regarding optimism and sports performance. To this end, a systematic review of the literature was conducted, taking in consideration only those that followed PRISMA guidelines (Urrútia & Bonfill, 2013). The following databases were used with the predefined inclusion criteria (optimism and sports performance): PubMed, WOS, Scopus, Psycinfo and SportDiscus. The study was assessed using the Critical Reading and Evaluation of Epidemiological Studies (Berra, Elorza-Ricart, Estrada & Sanchez, 2008). Interrater reliability was verified with Cohen's Kappacoefficient (2 judges). The majority of the studies performed correlational analyses between LOT scale results and athletic performance ($n = 7$). As a result, a positive correlation was observed between optimism and athletic performance. In general, the quality of the studies was considered average. Future studies should take in consideration the use of additional, higher quality and more rigorous experimental procedures.

Keywords: Performance; optimism; sports; LOT; systematic review.

Introduction

Physical activity and sports have long been a phenomenon of great social interest (García Ferrando, 1993; Sánchez Bañuelos 2002). Sports, when correctly performed, contribute to an individual's physical and psychological well-being, such as lower anxiety, higher concentration and less work absenteeism (Márquez, 2006).

Researchers in sports psychology have been studying for many years the psychological variables related to sports practice that clearly influence in an individual's health and performance in any context (Berger & Owen 1983; Márquez & Tabernero, 1996).

Regarding sports performance, researchers have generally focused on stress control (Morian-Elvira & Herruzo-Cabrera, 2004), attention (Hutchinson & Tenenbaum, 2007; Wulf, 2007), self-esteem (Vealey & Chase, 2008; Wilson, Sullivan, Myers, & Feltz, 2004), motivation (Amorós, 2007; Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2009; Mageau & Vallerand, 2003) and team cohesion (Carron, & Eys, 2012; Spink, Wilson & Priebe, 2010).

In recent years, coinciding with the consolidation of Positive Psychology, there has been an increased interest in

analysing the importance of constructs such as psychological wellbeing (González, Garcés de los Fayos & García, 2012; Liberal, Escudero, Cantallops & Ponseti, 2014), resilience (Fletcher & Sarkar, 2012; García et al. 2016; Reche, Tutte & Ortín, 2014), or optimism in sports (Fogarty, Perera, Furst & Thomas, 2016; Gaudreau, Gunnell, Hoar, Thompson & Lelièvre, 2015). The use of renown theoretical models, such as the concept of flow (Csikszentmihalyi, 1990) or Ryff's Wellbeing model (1989) in physical activity and sports, are providing interesting information that bring closer the gap between sports and health.

In this sense, one of the most relevant constructs in positive psychology is optimism (Marín, Ortín, Garcés de los Fayos & Tutte, 2013). Its systemic analysis began with the reformulation of the theory of learned helplessness in humans by Abramson, Seligman and Teasdale (1978), as a method to explain the confrontation responses to negative occurrences that appear during an individual's life, postulating the existence of two explanatory styles: optimism and pessimism.

Together with the focus on explanatory guidelines, the other most commonly used theoretic model is the dispositional optimism developed by Scheier and Carver (1987). In this perspective, optimism is regarded as the tendency to await favourable consequences in life occurrences. This tendency can influence in the confidence and persistence to search for an objective or challenge. In this manner, the pessimistic individual is more dubious and indecisive towards

*** Correspondence address [Dirección para correspondencia]:**

Francisco José Ortín. Facultad de Psicología. Universidad de Murcia.
 Campus de Espinardo, 30100 Murcia (Spain). E-mail: ortin@um.es

many situations, being more evident in adverse conditions (Carver & Scheier, 2005).

The scientific literature correlates optimism with performance and health in various contexts. Regarding health, various studies have demonstrated its influence in disease, pain and psychological well-being (Chang, D’Zurilla & Maydeu, 1994; Maruta, Colligan, Malinchoc & Oxford, 2000; McDonald & Harrison, 2016; Millstein, et al. 2016; Rees, Ingledew & Hardy, 2005; Remor, Amorós & Carrobbles, 2006). Specifically, in mental health, certain researchers have positioned optimism as a protective variable against certain disorders such as depression (Brissette, Scheier & Carver, 2002; Extremera, Duran & Rey, 2007; Hirsch and Lyness, 2014; Sánchez & Méndez, 2007, 2009).

Regarding performance, various studies have correlated optimism with higher confidence levels (Manzo, Silva & Mink, 2001), more adequate confrontation strategies (Gaudreau & Blondin, 2004), behavioural self-regulation (Gordon, 2008; Norlander & Archer, 2002; Wilson, Raglin & Pritchard, 2002), a higher control in stressful situations (Ortín, Garcés de los Fayos, Gosálvez, Ortega & Olmedilla, 2011) and a higher mental robustness (Nicholls, Polman, Levy & Backhouse, 2008).

Systematic reviews and meta-analysis, as methods to analyse and revise the studies of a corresponding aspect, have significantly improved the scientific quality of these studies. In this sense, Gilbody and Sowden, (2000) indicated that systematic reviews have solved the problem of the accumulating knowledge that was present in social sciences. Regarding Psychology, the traditional review articles were at risk of being biased or have contradictory conclusions. Certain authors (Sánchez-Meca & Botella, 2010; Botella & Sánchez-Meca, 2015) have indicated that systematic reviews constitute a method to analyse systematically and objectively the evidence of empiric studies concerning a certain problem. Other authors, such as Ferreira, Urrutia and Alonso-Coello (2011) on the other hand, consider that reviews are second-order research, as it regards to researching that which has been researched.

In sports, there are several systematic reviews focused on training aspects such as periodization (Martín, García, Salum, Sposito & Gomez, 2010), physiological response (Carazo, 2013) or its relation with cognitive and academic performance (Conde & Tercedor, 2015).

Regarding health, Ayala & Sainz de Baranda (2013), analysed the quality of the studies in stretching programmes. As for sports psychology, a recent study by Palmi and Solé (2016) analysed sports interventions based on mindfulness.

The objective of the study is to discern the possible correlation between optimism and sports performance through the review of previously published studies. Also, the methodological quality of the selected scientific articles was evaluated after performing a systematic review regarding optimism and sports performance.

Materials and Methods

Inclusion and Exclusion Criteria

The studies were selected using the following inclusion criteria: a) experimental or quasi-experimental design, b) studies that correlated optimism with performance in adult and young athletes, c) studies that evaluated sports performance and optimism, d) studies that specified the number of participants, e) studies that specified the questionnaire applied, f) written in English or Spanish, g) englobed all the temporal range of the databases used.

As for the exclusion criteria, these included not only the non-compliance of the inclusion criteria previously mentioned, but also the published works could not be a congress communication, summary, nor studies that have been published in non-scientific journals, books, thesis, or manuals. The age, performance or competitive levels of the subjects were not considered in the exclusion criteria.

Search Strategy

The search was performed between January and September 2016, using the following databases: ISI Web of Knowledge, Psycinfo, SportDiscus, Scopus and Pubmed. The key words used were: athletes, sport, exercise, optimism, improve and enhancement. These key words were combined in the following manner: athletes/performance/optimism; athletes/enhancement/optimism; athletes/improves/optimism; exercise/performance/optimism; exercise/enhancement/optimism; exercise/improves/optimism; sport/performance/optimism; sport/enhancement/optimism and sport/improves/optimism. Articles published between 1990 and 2016 were analysed. Finally, the empiric study references were revised and several prestigious experts of the field were contacted.

The systematic search process, following PRISMA guidelines (Urrutia & Bonfill, 2013) resulted in a total of 630 references, allowing us to select 7 articles that complied with the inclusion criteria. A flow diagram depicting the selection process can be seen in Figure 1.

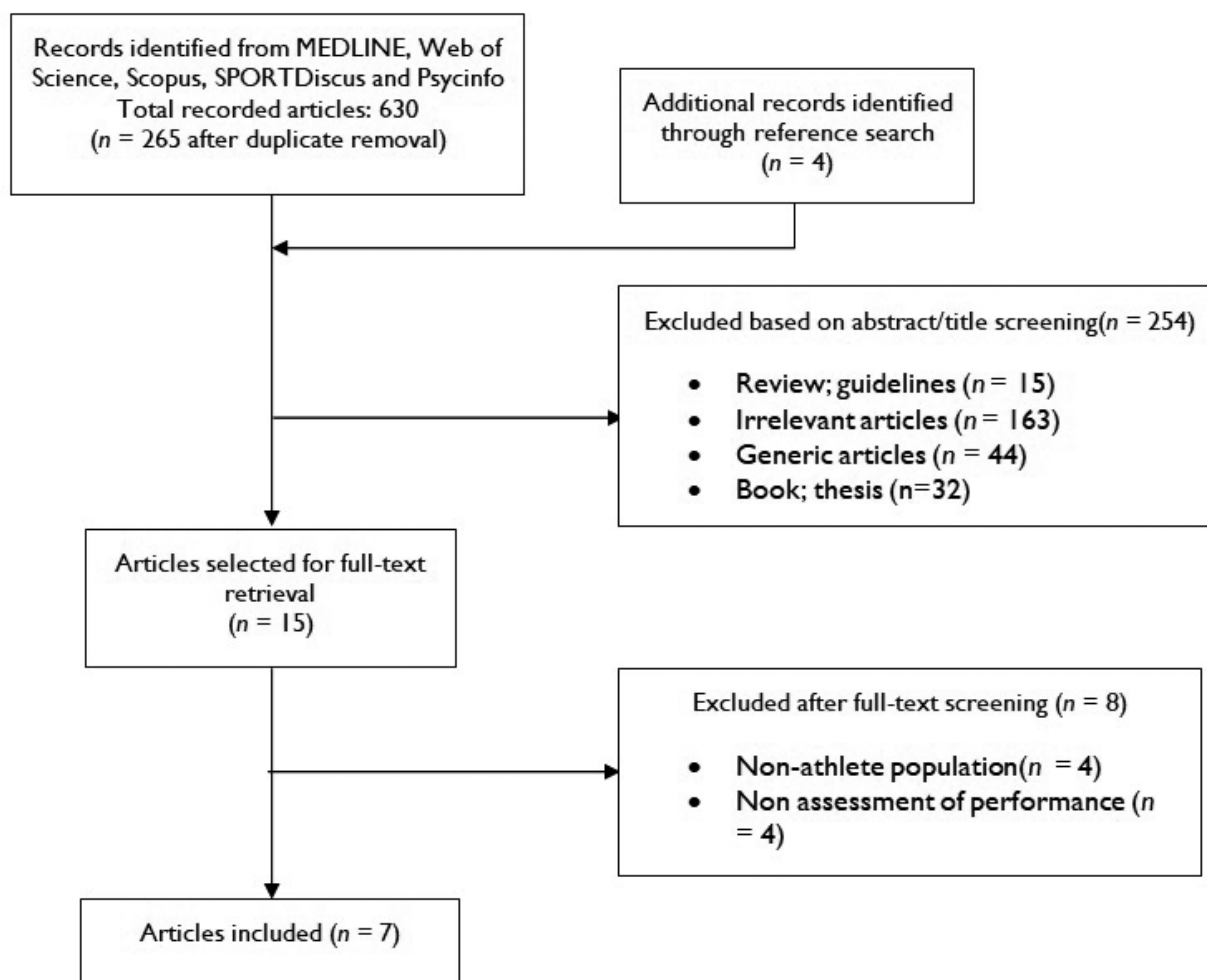


Figure 1. Flow Diagram.

Encoding of the Variables and Instrumentation

Two encoders (experts of the field) performed the selection process independently in order to analyse its reliability, and their results compared.

In order to evaluate the scientific quality of the studies included in the systematic review, the literature offers different options depending on the study design. In this sense, as indicated by Berra et al. (2008), the instruments created for the assessment of published works for systematic reviews and meta-analysis were mainly designed for analytical studies, such as randomized, cohort or case studies. On the other hand, fewer systematic tools have been developed for the analysis of transversal studies. These authors propose a defined instrument as "Instrument for critical reading and evaluation of transversal epidemiological studies," (p. 46 of the above reference).

The recommendations of the observational studies were considered, following the conclusions published by the Agency for Healthcare Research and Quality as well as the items included in other instruments that are commonly used

in Spain, such as the Scottish Intercollegiate Guidelines Group and Osteba (Evaluation of Sanitary Technology Service of the Basque Country).

The authors also mention as important the recommendations for editorial review processes of epidemiological studies indicated by the STROBE initiative (Von Elm et al., 2008).

The instrument for critical reading and evaluation of transversal epidemiological studies comprise of 27 items distributed in 8 dimensions (see Annex): 1) Question or object of research; 2) participants; 3) comparability with other studied groups; 4) definition and measuring of main variables; 5) statistical analysis and confusion; 6) results, 7) conclusions, external validity and applicability of the results; 8) conflict of interests.

Statistical Analysis

Each item was analysed separately in each article by two independent judge experts. Afterwards, the inter-judge reliability was calculated to evaluate the studies (Cerdá & Villar-

roel, 2008; Sánchez-Meca, Alacid-de-Pascual, López-Pina & Sánchez-Jiménez, 2016) using Cohen's Kappa Coefficient analysis for qualitative variables, which has a range of .7-1.

Results

The analysis of the seven selected articles was performed using two approaches. First, Tables 1 and 2 show the main data obtained from each article, emphasizing on aspects such as the theoretical model used to analyse optimism, the instrument to assess both optimism and performance, as well as a

summary sentence of the correlation between the two concepts.

On the other hand, as commented in the previous section, the quality of the studies was analysed using another, more specific instrument.

As for the first analysis, it is noteworthy to comment that three of the analysed studies (Gordon, 2008; Norlander & Archer, 2002; Seligman et al. 1990) presented two different studies each, which is reflected in the tables, considering them as independent investigations.

Table 1. Analysis of the selected studies.

Author	Year	Title	Language	Theoretical Model of Optimism	N
Seligman, Nolen-Hoeksema, Thornton and Thornton Study 1	1990	Explanatory style as a mechanism of disappointing athletic performance	English	Explanatory Style	33
Seligman, Nolen-Hoeksema, Thornton and Thornton Study 2	1990	Explanatory style as a mechanism of disappointing athletic performance	English	Explanatory Style	47
Norlander, T and Archer, T Study 1	2002	Predicting performance in ski and swim championships: Effectiveness of mood, perceived exertion, and dispositional optimism.	English	Dispositional	43
Norlander, T and Archer, T Study 2	2002	Predicting performance in ski and swim championships: Effectiveness of mood, perceived exertion, and dispositional optimism.	English	Dispositional	50
Martin-Krumm, Sarrazin, Peterson and Famose	2003	Explanatory style and resilience after sports failure	English	Explanatory Style	62
Gordon Study 1	2008	Attributional style and athletic performance: Strategic optimism and defensive pessimism	English	Explanatory Style	20
Gordon Study 2	2008	Attributional style and athletic performance: Strategic optimism and defensive pessimism.	English	Explanatory Style	18
García-Naveira and Díaz	2010	Relation between dispositional optimism/pessimism, performance and age of competitive soccer players	Spanish	Dispositional	151
Ortín, Garcés de los Fayos, Gosálvez, Ortega and Olmedilla	2011	Optimism and execution of sports in adverse conditions. Replicating Seligman 1990.	Spanish	Dispositional	66
De la Vega, Ruiz, Batista, Ortín and Giesenow	2012	Effects of Feedback on Self-Efficacy Expectations Based on the Athlete's Optimistic Profile	English	Dispositional	53

Table 2. Continuation of the analysis of the selected studies.

Author	Optimism Evaluation	Performance Measurement	Reliability and/or Validity	Performance/Optimism Relation
Seligman, Nolen-Hoeksema, Thornton and Thornton Study 1	ASQ	Time of the test	Cronbach's Alpha: 0.71, 0.76 and 0.79 for each scale dimension	Optimistic athletes have a better response to the adverse situations of negative results
Seligman, Nolen-Hoeksema, Thornton and Thornton Study 2	ASQ	Results in competition and trainer's expectations	Cronbach's Alpha: 0.71, 0.76 and 0.79 for each scale dimension	Optimistic athletes perform better in competitions
Norlander, T and Archer, T Study 1	LOT	Competition Results	Cronbach's Alpha 0.76 Reliability test-retest: 0.79	Optimistic athletes obtain better results
Norlander, T and Archer, T Study 2	LOT	Competition Results	Cronbach's Alpha 0.76 Reliability test-retest: 0.79	Optimistic athletes obtain worse results
Martin-Krumm, Sarrazin, Peterson and Famose	SESQ	Ability Circuit	Cronbach's Alpha: 0.75 and 0.71 for each scale dimension	Optimistic athletes suffer less anxiety and perform better after a negative feedback concerning performance
Gordon Study 1	ASQ	Rate of passes, goals, etc	Cronbach's Alpha: 0.72 and .70 Reliability test-retest: 0.87	Improved performance of optimistic athletes in the defeats

Author	Optimism Evaluation	Performance Measurement	Reliability and/or Validity	Performance/Optimism Relation
Gordon Study 2	LOT	Rate of passes, baskets, etc	Cronbach's Alpha: 0.78 in optimism, 0.63 in pessimism	Optimistic athletes have more assistances and interferences, but less rebounds and more fouls
García-Naveira and Díaz	LOT-R	Evaluation of the performance as assessed by the trainer during 16 matches	Cronbach's Alpha: 0.74 in optimism, 0.70 in pessimism	Moderately positive correlation between optimism and performance
Ortín, Garcés de los Fayos, Gosálvez, Ortega and Olmedilla	LOT-R	Time in the match	Cronbach's Alpha: 0.71 in optimism, 0.70 in pessimism	Optimistic athletes perform better after negative feedback
De la Vega, Ruiz, Batista, Ortín and Giesenow	LOT-R	Strength using a hand dynamometer	No	Optimistic athletes perform better after negative feedback

The analysed articles were published between 1990 and 2012. Concerning the theoretic approach to analyse optimism, three articles used explanatory methods (Gordon, 2008; Martin-Krumm et al. 2003; Seligman et al. 1990). The other studies analysed optimism using a dispositional perspective. Regarding this aspect, the works focused on disposition used the LOT and LOT-R questionnaires to assess optimism. As for the explanatory focus, the works generally used the ASQ questionnaire, except for Martin-Krumm et al. (2003) which applied a French modified version of the Sport Attributional Style Scale (Hanrahan, Grove & Hattie, 1989) called Sport Explanatory Style Questionnaire (Martin-Krumm, Sarrazin, Fontayne & Famose, 2001).

Regarding the language, the majority of the studies were in English, except for García-Naveira and Díaz, (2010) and Ortín et al. (2011).

All studies, except for Ortín et al. (2011), presented data regarding reliability and/or validity of the tests used to evaluate optimism (see Table 2).

As for the method to evaluate optimism, the studies applied either the LOT or ASQ questionnaires, or modified versions of these, which are the most widely used in the literature. The Life Orientation Test (LOT) (Scheier & Carver, 1985) and its reduced version (LOT-R) (Scheier, Carver & Bridges, 1994) analyse optimism from a dispositional perspective, whereas the Attributional Style Questionnaire (ASQ, Peterson, Semmel, Baeyer, Abramson, Metalsky & Seligman, 1982), evaluates optimism or pessimism through the explanatory theory. The bibliometric study by Marín et al. (2013) indicated that these are the most commonly used methods to assess optimism in various contexts, including sports.

On the other hand, there is much variation in how performance was measured. Certain works used the amount of time performing a task, such as in Seligman et al. (1990) (study 1) or Ortín et al. (2011). Others, such as Seligman et al. (1990) (study 2) and Norlander and Archer (2002) measured the result of the competition. Gordon (2002) analysed the amount of success in executing a movement, such as goals, baskets, or passes. Similarly, Martin-Krumm et al. (2003) measured these same actions but in a prepared circuit. De la Vega et al. (2012) analysed the strength when using a hand dynamometer. Lastly, Garcia-Naveira and Diaz (2010)

referred to the trainer's expectations regarding the athlete's performance, which was also measured by Seligman et al. (1990) (study 2) albeit combined with the athlete's result in the competition.

The most relevant information from each of the 7 selected studies are explained below.

Seligman's study (1990) supposed a turning point in sports optimism research. In this study, the swimmers were given a falsely-negative feedback after the first swim. The results indicated that the more optimistic swimmers improved their time in the second swim, while the pessimistic ones significantly decreased their performance (i.e. took longer to complete the swim). Ortín et al. (2011) performed a similar study but measuring optimism through a dispositional perspective. The results of this study were similar to those observed by Seligman. In this case, although not all the optimistic athletes improved their time, those that did improve were optimistic. On the other hand, regarding the athletes that obtained worse results in the second test, the pessimistic ones obtained much lower scores than the optimistic athletes.

In 2002, Norlander and Archer published two studies, using swimmers and skiers, analysing their results in a competition correlating with the optimistic or pessimistic profile of the athletes, as well as their mood state during the several weeks prior to the competition. In the first study, analysing 43 skiers of different specialities, the results indicated that the athletes with higher scores in optimism obtained better results in the competition. However, the second study, using 50 swimmers, obtained contradicting results, where the optimistic athletes performed worst. Both studies were performed during national-level competitions of the respective sport.

Martin-Krumm et al. (2003), used negative feedback to analyse the reaction of the individuals and the correlation between optimism, performance, anxiety and self-confidence, in 62 basketball players. In this study, the more optimistic athletes were less anxious, more confident and obtained better results in the second trial after receiving the negative feedback.

Gordon (2008) performed two studies measuring optimism and performance, while also analysing the attributional profile of the individuals. In the first work, 20 soccer players were analysed with the ASQ questionnaire and 8 competition

matches were recorded, using variables such as goals, fouls committed, passes intent, passes completed, etc. In the second article, 18 basketball players completed both the ASQ and LOT questionnaires. The results of the first study indicated that the optimistic players performed better (more successful in performing their actions) after committing an error. The second study, however, obtained mixed results. The optimistic players obtained higher scores in number of assists and interceptions, but also committed more fouls and captured less rebounds. The attributional analysis indicated that the more optimistic individuals presented an attribution in negative situations (low performance) towards the lack of effort compared to the capability.

García-Naveira and Díaz, (2010), analysed the correlation between optimism and performance, as well as optimism and age. With a sample size of 151, the highest of the selected studies, the results indicated a moderately-positive correlation between optimism and performance. On the other hand, a tendency, though not quite significant, was observed when comparing optimism and age, with a higher score obtained in the older individuals.

Lastly, De la Vega et al. (2012) analysed various aspects. On one hand, the correlation between performance and self-efficacy expectations was assessed. On the other, the authors determined how a progressive increase in negative feedback could affect the individual's performance. Lastly, the authors assessed if there were differences in performance when feedback was present or not. Using a sample of 53 soccer players, the results showed significant differences between optimism/pessimism levels regarding the self-perceived efficacy. Also, significant differences were obtained when analysing the effects of the feedback, where a lower decrease in result expectations was observed in the more optimistic individuals.

As for the analysis of the methodological quality of the studies, Table 3 depicts the values obtained in the instruments for critical reading and evaluation of the transversal epidemiological studies. The dimensions for scientific evidence were assessed in the 7 selected studies using the criteria of the instrument designed for the critical assessment of the original articles (Berra et al. 2008).

Also, as indicated in the Statistical Analysis section of Materials and Methods, a Cohen's Kappa Coefficient for qualitative values was calculated, with results ranging 0.7 to 1.

Table 3. Critical assessment of the articles and Cohen's Kappa Coefficient.

a. Research question/objective	1.00
b. Participants	0.85
c. Comparability among the studied groups	0.82
d. Definition and measurement of the main variables	0.76
e. Statistical analysis and confusion	0.85
b-e. Global assessment of the internal validity of the study	0.71
f. Results	0.88
g. Conclusions, external validity and applicability of the results	1.00
h. Conflict of interests	1.00

From the evaluation it is possible to conclude that the quality of the study was average, as the majority of the aspects assessed can be considered "good" or "average."

The aspects with lower scores were those referring to the participants of the study, specifically their inclusion in certain experimental groups, the absence of a precise description of the inclusion/exclusion criteria used, and the methods/sources for the selection process. Also, the studies analysed should improve their sample size, as well as confidence level and statistical strength of their sample.

Discussion

The number of studies concerning optimism in sports has increased in recent years (Marín et al, 2013). Optimism has been generally analysed with respect to its effect on performance. However, the number of studies that specifically measure performance is rather low, despite being the objective of the study, which is a clear methodological deficit. Although the majority of the studies are driven based on their different theoretical foci, one of the aspects that should be more homogeneous among them is the method used to measure performance, as 6 different methods were observed among the 7 articles.

The majority of the studies regarding optimism, not only from a sports point of view, use a dispositional focus. Therefore, questionnaires LOT and LOT-R are generally used, as commented in the study published by Marín et al. (2013). One possible reason for this is that the questionnaires used in the dispositional model are much shorter than those used in the explanatory model. Regarding the dispositional model, and its correlation with the questionnaires mentioned, the scientific literature shows that there are many methods to measure or interpret the construct. As for the correction or interpretation of the questionnaires, there are two options (Ferrando, Chico & Tous, 2002). On one hand, the measurement of each individual disposition can be used, whereas another possibility is to measure total optimism when the items are written in a negative manner. Certain authors consider measuring optimism and pessimism as two separate factors (Mroczek, Spiro, Aldwin, Ozer & Bosse, 1993; Myers & Steed, 1999). However, Cano-García et al. (2015) compared 7 empirical models, with the final conclusion that it is more recommendable to use one sole score that represents the total level of dispositional optimism, which the authors have called vital orientation.

The studies analysed seem to indicate that there is a correlation between optimism and performance in sports. In this sense, studies such as those described here prove the importance of teaching specific strategies to the technicians and trainers in order to increase the athlete's level of optimism.

Studies with higher quality methods are necessary to confirm this correlation between optimism and sports performance. The results of this review allow the possibility of providing various recommendations for future studies in this

field. As indicated in the Results section, it is necessary to improve the methodological quality, emphasizing on certain indicators of quality (such as the method of assigning individuals into certain groups, etc) so that the results obtained may not be considered biased due to lack of proper controls. Another aspect to consider is to include a precise description of the inclusion/exclusion criteria, as well as the methods and sources of the selection. On the other hand, it is important to estimate the adequate sample size, confidence level or statistical strength of the sample. Lastly, the inclusion of statistical techniques related to meta-analysis studies should be considered in future studies.

Regarding studies relating optimism and sports, it is vital for future studies to use a single method to measure performance so that it may be possible to compare them. On the other hand, these studies should apply specific intervention programmes for a sports context in order to analyse the efficacy of possible techniques or strategies to increase optimism.

Conclusions

The objective of this study was to perform a systematic review of the scientific articles that correlate optimism with

sports performance. In this sense, the number of studies is low, and even more so when the inclusion criteria included that the study must present a specific method to measure performance. Despite the low number of studies, the majority indicated that optimistic athletes performed better in competitions or when confronted to adverse situations, such as poor results (being real or informed). Only two of the studies analysed presented contradictory results, with lower performance levels detected in the optimistic athletes.

The accumulated scientific knowledge correlating performance and optimism has been rather lacking, making it difficult to obtain solid conclusions of the studies. However, it could be interesting to perform more studies of this topic since, as commented in the Introduction section. To this end, various studies have demonstrated the influence of optimism in an individual's psychological functioning. If optimism is a method to measure health, it is possible to believe that it may improve performance, but it is very important to improve the scientific quality of the studies based on information provided in this review.

References

- Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. D. (1978). Learned helplessness in human: Critique and reformulation. *Journal of Abnormal Psychology*, 87, 49-74.
- Amoros, A. J. (2007). Coaching effectiveness: Exploring the relationship between coaching behavior and motivation from a self-determination theory perspective. In N. Chatzisarantis y M. S. Hagger (Eds.), *Self-determination in sport and exercise* (pp. 209-227). Champaign, IL: Human Kinetics.
- Ayala, A., & Sainz de Baranda, M. P. (2013). Methodological quality of stretching programs: systematic review. *Revista Internacional de Medicina y Ciencias de la Actividad Física y el Deporte*, 49, 163-181.
- Bartholomew, K. J., Ntoumanis, N., & Thøgersen-Ntoumani, C. (2009). A review of controlling motivation strategies from a self-determination theory perspective: Implications for coaches. *International Review of Sport and Exercise Psychology*, 2, 215-233. doi: 10.1080/17509840903235330
- Berger, B. G., & Owen, D. R. (1983). Mood alteration with swimming-swimmers really do "feel better". *Journal of Psychosomatic Research*, 45, 425-433.
- Berra, S., Elorza-Ricart, J. M., Estrada, M. D., & Sánchez, E. (2008). Aroot for the critical appraisal of epidemiological cross-sectional studies. *Gaceta Sanitaria*, 22(5), 492-497. doi: 10.1157/13126932
- Botella, J., & Sánchez-Meca, J. (2015). *Meta-analysis in Social and Health Sciences*. Madrid: Síntesis.
- Brisette, I., Scheier, M. F., & Carver, C. S. (2002). The role of optimism in social network development, coping, and psychological adjustment during a life transition. *Journal of Personality and Social Psychology*, 82, 102-115. doi:10.1037/0022-3514.82.1.10
- Cano-García, F. J., Sanduvete-Chaves, S., Chacón-Moscoso, S., Rodríguez-Franco, L., García-Martínez, J., Antuña-Bellerín, M. A., & Pérez-Gil, J. A. (2015). Factor structure of the spanish version of the Life Orientation Test-Revised (LOT-R): Testing several models. *International Journal of Clinical and Health Psychology*, 15, 139-148. doi: 10.1016/j.ijchp.2015.01.003
- Carazo, P. (2013). Physiological responses and adaptations to taekwondo training. A systematic review. *Pensar en Movimiento: Revista de Ciencias del Ejercicio y Salud*, 11, 1-19. doi:10.15517/pensarmov.v11i2.8726
- Carron, A. V., & Eys, M. A. (2012). *Group dynamics in sport* (4th ed.). Morgantown, WV: Fitness Information Technology.
- Carver, C. S., & Scheier, M. F. (2005). Optimism. In C. R. Snyder & S. J. Lopez, (Eds.). *Handbook of positive psychology* (pp. 231-243). New York: Oxford University Press.
- Cerdá, J., & Villarroel, L. (2008). Evaluation of the interobserver concordance in pediatric research: the Kappa Coefficient. *Revista Chilena de Pediatría*, 79(1), 54-58. doi: 10.4067/S0370-41062008000100008
- Chang, E. C., D'Zurilla, T. J., & Maydeu-Olivares, A. (1994). Assessing the dimensionality of optimism and pessimism using a multimeasure approach. *Cognitive Therapy and Research*, 18, 143-160. doi: 10.1007/bf02357221
- Conde, M.A., & Tercedor, P. (2015). Physical activity, physical education and fitness could be related to academic and cognitive performance in young. A systematic review. *Archivos de Medicina del Deporte*, 166, 100-109.
- Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York: Harper y Row.
- *De la Vega, R., Ruiz, R., Batista, F., Ortín, F. J., & Giesenow, C. (2012). Effects of feedback on self-efficacy expectations based on the athlete's optimistic profile. *Psychology*, 3(12A), 1208-1014. doi: 10.4236/psych.2012.312A179
- Extremera, N., Durán, A., & Rey, L. (2007). Perceived emotional intelligence and dispositional optimism-pessimism: Analyzing their role in predicting psychological adjustment among adolescents. *Personality and Individual Differences*, 42, 1069-1079.
- Ferrando, P. J., Chico, E., & Tous, J.M. (2002) Psychometric properties of the 'Life Orientation Test'. *Psicothema*, 14(3), 673-680.
- Ferreira, I., Urrutia, G., & Alonso-Coello, P. (2011). Systematic reviews and meta-analysis: Scientific rationale and interpretation. *Revista Española de Cardiología*, 64(8), 688-696. doi: 10.1016/j.recsep.2011.03.029

- Fletcher, D., & Sarkar, M. (2012). A grounded theory of psychological resilience in Olympic Champions. *Psychology of Sport and Exercise*, 13(5), 669-678. doi: 10.1016/j.psychsport.2012.04.007
- Fogarty, G. J., Perera, H. N., Furst, A. J., & Thomas, P. R. (2016). Evaluating measures of optimism and sport confidence. *Measurement in Physical Education and Exercise Science*, 20(2), 81-92. doi:10.1080/1091367X.2015.1111220
- García Ferrando, M. (1993). *Free time and sports activities of youth in Spain*. Ministerio de Asuntos Sociales: Madrid.
- *García, A., & Díaz Morales, J.F. (2010). Relationship between optimism / dispositional pessimism, performance and age in competitive soccer players. *Revista Iberoamericana de Psicología del Ejercicio y del Deporte*, 5(1), 45-60.
- García, X., Molinero, O., Salguero, A., Ruiz, R., De la Vega, R., & Márquez, S. (2016). Relationship between resilience and coping strategies in competitive sport. *Perceptual and Motor Skills*, 122(1), 336-349. doi: 10.1177/0031512516631056
- Gaudreau, P., Gunnell, K. E., Hoar, S. D., Thompson, A., & Lelièvre, J. (2015). Optimism, pessimism, and coping in a dual-domain model of sport and school satisfaction. *Sport, Exercise, and Performance Psychology*, 4(2), 140-152. doi: 10.1037/spy0000032
- Gilbody, S., & Sowden, A. (2000). Systematic review in mental health. In N. Rowland and S. Goss (Eds.), *Evidence-based counselling and psychological therapies* (pp. 147- 70) Londres: Routledge.
- González, J., Garcés de los Fayos, E.J., & García, A. (2012). Indicators of psychological well-being perceived by physical education. *Revista de Psicología del Deporte*, 21(1), 183-187.
- *Gordon, R. (2008). Attributional style and athletic performance: Strategic optimism and defensive pessimism. *Psychology of Sport and Exercise*, 9, 336-350. doi: 10.1016/j.psychsport.2007.04.007
- Gaudreau, P., & Blondin, J. P. (2004). Differential associations of dispositional optimism and pessimism with coping, goal attainment, and emotional adjustment during sport competition. *International Journal of Stress Management*, 1(3), 245-269. doi: 10.1037/1072-5245.11.3.245
- Hanrahan, S., Grove, J. R., & Hattie, J. A. (1989). Development of a questionnaire measure of sport-related attributional style. *International Journal of Sport Psychology*, 20, 114-134.
- Hirsch, J. K., & Lyness, J. M. (2014). Family criticism and depressive symptoms in older adult primary care patients: Optimism and pessimism as moderators. *American Journal of Geriatric Psychiatry*, 22(6), 632-635. doi: 10.1016/j.jagp.2013.04.008
- Hutchinson, J. C., & Tenenbaum, G. (2007). Attention focus during physical effort: The mediating role of task intensity. *Psychology of Sport and Exercise*, 8, 233-245. doi: 10.1016/j.psychsport.2006.03.006
- Liberal, R., Escudero, J.T., Cantallops, J., & Ponseti, J. (2014). Psychological impact of sports injuries related to psychological well-being and the anxiety associated to competitive sports. *Revista de Psicología del Deporte*, 23(2), 451-456.
- Mageau, G. A., & Vallerand, R. J. (2003). The coachathlete relationship: A motivational model. *Journal of Sports Sciences*, 21, 883-904. doi: 10.1080/026401031000140374
- Manzo, L.G., Silva, J. M., & Mink, R. (2001). The Carolina Sport Confidence Inventory. *Journal of Applied Sport Psychology*, 13(3), 260-274.
- Marín, E., Ortín, F. J., Garcés de los Fayos, E., & Tutte, V. (2013). Bibliometric analysis of burnout and optimism in sport. *Revista Euroamericana de Ciencias del Deporte*, 2(1), 77-87.
- Márquez, S. (2006). Stress coping strategies in the sports field: theoretical foundations and evaluation tools. *International Journal of Clinical and Health Psychology*, 6(2), 359-378.
- Márquez, S., & Tabernero, B. (1996). Effects of a maintenance gym program on the profile of emotional states. *Educación Física y Deportes*, 46, 19-25.
- Martín, E. H., García, J. M., Salum, E., Sposito, C. A., & Gomes, C.A. (2010). Applicability of the periodization models of the sport training. A systematic review. RYCIDE. *Revista Internacional de Ciencias del Deporte*, 6(20), 231-241.
- Martin-Krumm, C., Sarrazin, P., Fontayne, P., & Famose, J. P. (2001). Validation of the Sport Explanatory Style Questionnaire. *Proceeding of the Ninth International Congress of the French Association of sport and exerciseresearchers*. Valence, France, 1-3 November.
- *Martin-Krumm, C., Sarrazin, P., Peterson, C., & Famose, J. (2003). Explanatory style and resilience after sport failure. *Personality and Individual Differences*, 35, 1685-1697.
- Maruta, T., Colligan, R. C., Malinchoc, M., & Offord, K. P. (2000). Optimists vs. pessimists: Survival rate among medical patients over a 30-year period. *Clinic Proceedings*, 75, 140-143.
- McDonald, D. D., & Harrison, L. (2016). The relationship between reminiscence functions, optimism, depressive symptoms, physical activity, and pain in older adults. *Research in Gerontological Nursing*, 9(5), 223-231. doi: 10.3928/19404921-20160531-01.
- Millstein, R.A., Celano, C. M., Beale, E. E., Beach, S. R., Suarez, L., Belcher, A. M., ... & Huffman, J. C. (2016). The effects of optimism and gratitude on adherence, functioning and mental health following an acute coronary syndrome. *General Hospital Psychiatry*, 43, 17-22. doi:10.1016/j.genhosppsych.2016.08.006
- Moriana-Elvira, J. A., & Herruzo-Cabrera, J. (2004). Stress and burnout in teachers. *International Journal of Clinical and Health Psychology*, 4, 597-621.
- Mroczek, D. K., Spiro III, A., Aldwin, C. M., Ozer, D. J., & Bosse, R. (1993). Construct validation of optimism and pessimism in older men: Findings from the normative aging study. *Health Psychology*, 12, 406-409.
- Myers, L. B., & Steed, L. (1999). The relationship between dispositional optimism, dispositional pessimism, repressive coping and trait anxiety. *Personality and Individual Differences*, 27(6), 1261-1272.
- Nicholls, A. R., Polman, R. C., Levy, A. R., & Backhouse, S. H. (2008). Mental toughness, optimism, pessimism, and coping among athletes. *Personality and Individual Differences*, 44(5), 1182-1192.
- *Norlander, T., & Archer, T. (2002). Predicting performance in ski and wim championships: Effectiveness of mood, perceived exertion, and dispositional optimism. *Perceptual and Motor Skills*, 94, 153-164.
- Ortín, F. J., Marín, E., & Garcés de los Fayos, E. (2012). Bibliometric analysis of optimism in physical activity and sport. *Actas del I Congreso Nacional de Psicología Positiva*. Sociedad Española de Psicología Positiva. El Escorial. España.
- *Ortín, F. J., Garcés de los Fayos, E., Gosálvez, J., Ortega, E., & Olmedilla, A. (2011). Optimism and sport performance in adverse conditions. Replicating Seligman 1990. *Revista de Psicología del Deporte*, 20(2), 491-501.
- Palmi, J., & Solé, S. (2016). Intervenciones basadas en mindfulness (atención plena) en psicología del deporte. *Revista de Psicología del Deporte*, 25(1), 147-155.
- Peterson, C., Semmel, A., Von Baeyer, C., Abramson, L. Y., Metalsky, G. I., & Seligman, M. E. P. (1982). The Attributional Style Questionnaire. *Cognitive Therapy and Research*, 6, 287-300.
- Reche, C., Tutte, V., & Ortín, F. J. (2014). Resilience, optimism and burnout in competitive judokas in Uruguay. *Revista Iberoamericana de Psicología del Ejercicio y el Deporte*, 9(2), 271-286.
- Rees, T., Ingledew, D. K., & Hardy, L. (2005). Attribution in sport psychology: Seeking congruence between theory, research, and practice. *Psychology of Sport and Exercise*, 6, 189-204.
- Remor, E., Amorós, M., & Carrobes, J. A. (2006). Relationship between optimism, anger experience and symptoms of physical distress. *Anales de Psicología*, 22(1), 37-44.
- Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, 57(6), 1069-1081. doi:10.1037/0022-3514.57.6.1069.
- Sánchez Bañuelos, F. (2002). Perspectives and orientations for school sports. 2º Congreso de Ciencias de la Actividad Física y Deporte. Madrid.
- Sánchez, O., & Méndez, F. J. (2007). Prevention of childhood depression by encouraging optimism. *Revista de Psicoterapia*, 18(2), 77-89.
- Sánchez, O., & Méndez, F. J. (2009). Optimism as a protective factor in child and adolescent depression. *Revista de Psicología Clínica y de la Salud*, 20(3), 273-280.
- Sánchez-Meca, J., Alacid-de-Pascual, I., López-Pina, J. A., & Sánchez-Jiménez, J. C. (2016). Generalization meta-analysis of the Leyton Obsessional Inventory Child version survey form. *Revista Española de Salud Pública*, 90, e1-e14.
- Sánchez-Meca, J., & Botella, J. (2010). Systematic reviews and meta-analysis: tools for professional practice. *Papeles del Psicólogo*, 31(1), 7-17.

- Scheier, M. F., & Carver, C.S. (1985). Optimism, coping and health: Assessment and implications of generalized outcome expectancies. *Health Psychology, 4*, 219-247.
- Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self mastery and self esteem): A reevaluation of the Life Orientation Test. *Journal of Personality and Social Psychology, 67*, 1063-1078.
- Scheier, M. F., & Carver, C.S. (1987). Dispositional optimism and physical well-being: the influence of generalized outcome expectancies on health. *Journal of Personality, 55*, 169-210.
- *Seligman, M.E.P., Noles-Hoeksema, S., Thorton, N., & Thorton, K. (1990). Explanatory style as a mechanism of disappointing athletic performance. *Psychological Science, 1*, 143-146.
- Spink, K. S., Wilson, K. S., & Priebe, C. S. (2010). Groupness and adherence in structured exercise settings. *Group Dynamics: Theory, Research, and Practice, 14*, 163-173. doi: 10.1037/a0017596
- Urrutia, G., & Bonfill, X. (2013). The PRISMA statement: a step in the improvement of the publications of the Revista Española de Salud Pública. *Revista Española de Salud Pública, 87*(2), 99-102. doi: 10.4321/S1135-57272013000200001.
- Verhagen, A. P., De Vet, H. C. W., De Bie, R. A., Kessels, A. G., Boers, M., & Knipschild, P. G. (1998). Balneotherapy and quality assessment: interobserver reliability of the Maastricht criteria list for blinded quality assessment. *Journal of Clinical Epidemiology, 51*, 335-341.
- Vealey, R. S., & Chase, M. A. (2008). Self-confidence in sport: Conceptual and research Advances. In T.S. Horn (Ed.), *Advances in sport psychology* (pp. 65-97). Champaign, IL: Human Kinetics.
- Viadé, A. (2003). *Psychology of sports performance*. Barcelona: Editorial UOC.
- Von Elm, E., Altman, D. G., Egger, M., Pocock, S. J., Gotsche, P. C., & Vandenbroucke, J. P. (2008). The strengthening the reporting of observational studies in epidemiology [STROBE] statement: guidelines for reporting observational studies. *Gaceta Sanitaria, 22*(2), 144-150.
- Wilson, G. S., Raglin, J. S., & Pritchard, M. E. (2002). Optimism, pessimism, and precompetition anxiety in college Athletes. *Personality and Individual Differences, 32*(5), 893-902.
- Wilson, R. C., Sullivan, P. J., Myers, N. D., & Feltz, D.L. (2004). Sources of sport confidence of master athletes. *Journal of Sport and Exercise Psychology, 26*, 369-384.
- Wulf, G. (2007). Attentional focus and motor learning: A review of 10 years of research. *E-Journal Bewegung und Training, 1*, 1-11.

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